GRADE 9 MATHEMATICS
CURRICULUM SPECIFICATIONS
(Program of Studies, 1978)

CURRICULUM BRANCH

Alberta

The Mathematics Curriculum specifications for Grade 9 were prepared in July 1981 by a committee of classroom teachers, consultants, and Alberta Education personnel under the direction of the Curriculum Branch. Alberta Education acknowledges with appreciation the contributions of the following members of the Grade 9 Mathematics Committee:

> B. Stonell, Alberta Education, CHAIRMAN
> G. Popowich, Alberta Education
> W. Lencucha, Alberta Education
> M. Lastiwka, Edmonton Public School Board
> D. Kopan, Calgary Board of Education
> M. Russell, Sturgeon School Division
> H. Ward, Red Deer School District
> R. Cammaert, Taber School Division

The following considerations determined the final curriculum specifications for Grade 9.

1. The specifications were based on the *Program of Studies for Junior High Schools, 1978* (amended 1981).

2. Content objectives were used to establish the specifications. Attitudes, interests, and self-concept goals were carefully considered but not included at this time.

	Per Cent Emphases*
Number Systems	22
A. Whole Numbers	
– Writes the values for powers (whole number exponents).	1
– Understands and uses the following properties:	3
a) $(a^x)^y = a^{xy}$	
b) $a^{-x} = \dfrac{1}{a^x}$	
c) $a° = 1, a \neq 0$	
– Maintains previously developed skills in problem solving.	1
– Expresses a number as a product of factors (including prime factorization).	1
B. Integers	
– Maintains previously developed skills.	2
– Simplifies expressions involving the order of operations (four arithmetic operations and powers).	1
C. Rationals	
– Maintains previously developed skills.	–
– Writes any number in scientific notation and vice versa.	1
– Recognizes a need for negative rationals.	–
– Writes positive or negative rationals in the lowest terms or higher terms.	–
– Adds, subtracts, multiplies, and divides positive or negative rational numbers.	3
– Changes positive or negative rationals in the form a/b, $b \neq 0$, to decimals.	1

*Where dashes (–) appear in this column, the objective is to receive minor emphasis.

	Per Cent Emphases
– Changes rational numbers in decimal form to the form *a/b*.	1
– Solves problems involving positive and/or negative rationals (emphasis on decimals).	4
– Estimates products and quotients to determine if an answer is reasonable.	2
– Estimates square roots of numbers.	1
– Uses tables to determine the square root of a number.	–
Ratios and Proportions	10
– Maintains previously developed skills.	3
– Uses ratios to solve problems involving: a) percentages b) distance, speed, and time c) profit, interest, commission, tax, discount, premiums.	5
– Uses ratios to construct scale drawings.	2
Measurement	6
– Maintains previously developed skills.	4
– Calculates surface areas (SI units) of prisms and cylinders using formulas.	–
– Calculates the area of regular polygons.	2
Geometry	22
– Maintains previously developed skills.	3
– Demonstrates knowledge of the Theorem of Pythagoras through an ability to solve problems.	4
– With compass and straight-edge, constructs triangles congruent to given triangles, using SSS, SAS, and ASA.	1

	Per Cent Emphases
– Constructs regular polygons.	1
– Uses such terms as *edges*, *faces*, *lateral face*, *base*, *height*, and *slant height* in examining prisms, pyramids, and other polyhedra.	1
– Classifies right prisms and right pyramids, given models of various types.	2
– Constructs models of right prisms, right pyramids, or regular polyhedra as specified by the teacher.	1
– With assistance, develops formulas to measure volume and surface area of right prisms and cylinders.	3
– Given word problems or diagrams and formulas, solves volume and surface area problems.	6
Graphing	5
– Makes graphs from mathematical data and recognizes the dependent variable and the relation constant. (Limit to linear relations.)	4
– Pictures square roots of numbers graphically and reads approximate roots of non-perfect squares from the graph.	1
Algebra	35
– Solves any first-degree equation in one variable with rational coefficients.	3
– Writes word problems for given mathematical statements.	–
– Solves a variety of problems by writing an equation in one variable and solving same.	2
– Knows that letters represent variables.	–
– Knows that formulas represent rules or definitions that express a relation between variables in mathematics and/or science.	1
– Interprets mathematical data and can express it as a relationship. (Limit to linear relations using a non-formal approach.)	2

CONTENT OBJECTIVES

	Per Cent Emphases
- Applies mathematical principles of variation and formulas to real situations.	2
- Predicts the effect of altering specific elements of a formula.	1
- Solves problems that require the use of a formula.	4
- Identifies specific algebraic terminology: *constants, variables, terms,* and *factors* in an expression.	1
- Evaluates expressions by performing the operations in correct order.	1
- Classifies polynomials as monomials, binomials, or trinomials.	1
- States the degree of a polynomial and writes the polynomial in standard form.	1
- Translates English expressions into algebraic expressions.	1
- Identifies the numerical coefficient of a monomial.	1
- Identifies "like" and "unlike" terms and is able to combine like terms.	1
- Finds the sum and difference of polynomials by reordering the elements.	2
- Finds the products and quotients of monomials.	2
- Finds the product of a monomial and a polynomial.	1
- Factors a polynomial by taking out the greatest common factor.	2
- Finds the product of binomials.	3
- Factors trinomials $ax^2 + bx + c$, where $a = 1$.	3
TOTAL	100

Digitized by the Internet Archive
in 2016